Cisco Aironet 4.5-dBi Low Profile Omnidirectional Antenna (AIR-ANT5145V-R)

This document describes the Cisco Aironet 4.5-dBi Diversity Omnidirectional Antenna (AIR-ANT5145V-R), and provides instructions for mounting it. The antenna operates in the 5-GHz frequency range and is designed for use indoors.

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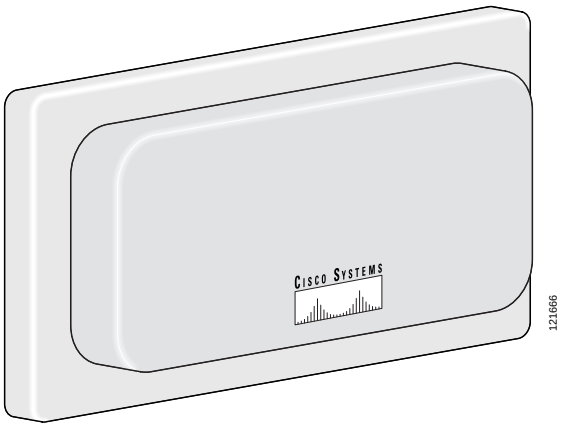
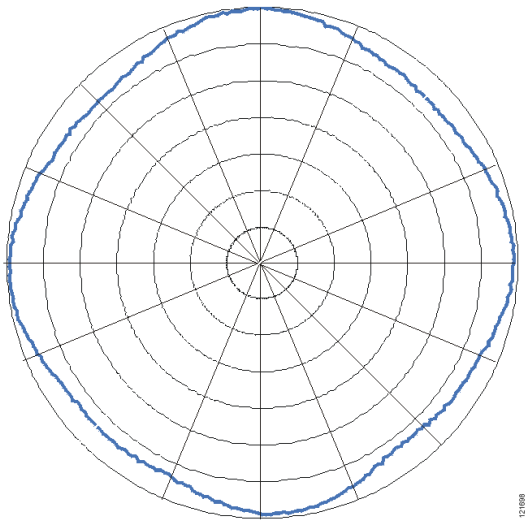
Technical Specifications

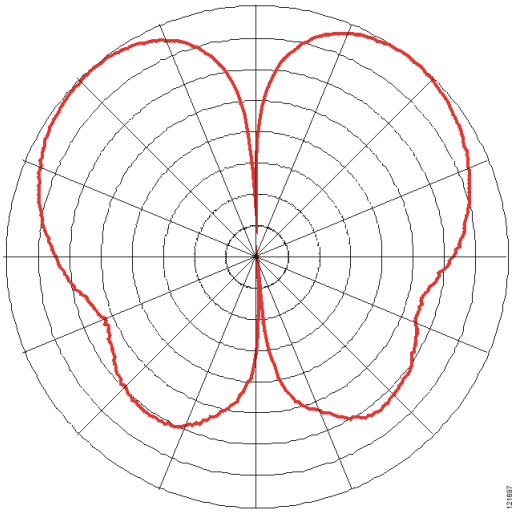
Antenna type	Omnidirectional TM02 Mode Patch
Operating frequency range	5150 – 5850 MHz
Nominal input impedance	50Ω
2:1 VSWR bandwidth	5000 – 6000 MHz
Gain	4.5 dBi
Polarization	Linear
Front-to-back ratio	10 dB
E-plane 3dB beamwidth	50
H-plane 3dB beamwidth	Omnidirectional
Cable length and type	36 in. (91.4 cm) Plenum rated UV stable LMR-185
Connector type	2 RP-TNC Male
Length	5 in. (12.7 cm)
Width	3 in. (7.6 cm)
Height	0.75 oz (21.2 g)
Operating temperature	–22 F– 158 F(–30 C – 70 C)
Storage temperature	–40 F– 185 F(–40 C – 85 C)
UL2043 compliant	Yes
Environment	Indoor, office



H-Plane Pattern



E-Plane Pattern



System Requirements

This antenna is designed for use with Cisco Aironet access points and bridges but can be used with any 5-GHz Cisco Aironet radio device that utilizes reverse polarity Neil Councilman (RP-TNC) connectors.

Installation Guidelines

Because the antenna transmits and receives radio signals, they are susceptible to RF obstructions and common sources of interference that can reduce throughput and range of the device to which they are connected. Follow these guidelines to ensure the best possible performance:

- Mount the antenna to utilize its propagation characteristics. One way to do this is to orient the antenna horizontally and mount it as high as possible.
- Keep the antenna away from metal obstructions such as heating and air-conditioning ducts, large ceiling trusses, building superstructures, and major power cabling runs. If necessary, use a rigid conduit to lower the antenna away from these obstructions.
- The density of the materials used in a building's construction determines the number of walls the signal must pass through and still maintain adequate coverage. Consider the following before choosing the location to install your antenna:
  - Paper and vinyl walls have very little affect on signal penetration.
  - Solid and pre-cast concrete walls limit signal penetration to one or two walls without degrading coverage.
  - Wood and concrete block walls limit signal penetration to three or four walls.
  - A signal can penetrate five or six walls constructed of drywall or wood.
  - A thick metal wall causes signals to reflect off, causing poor penetration.

Safety Instructions

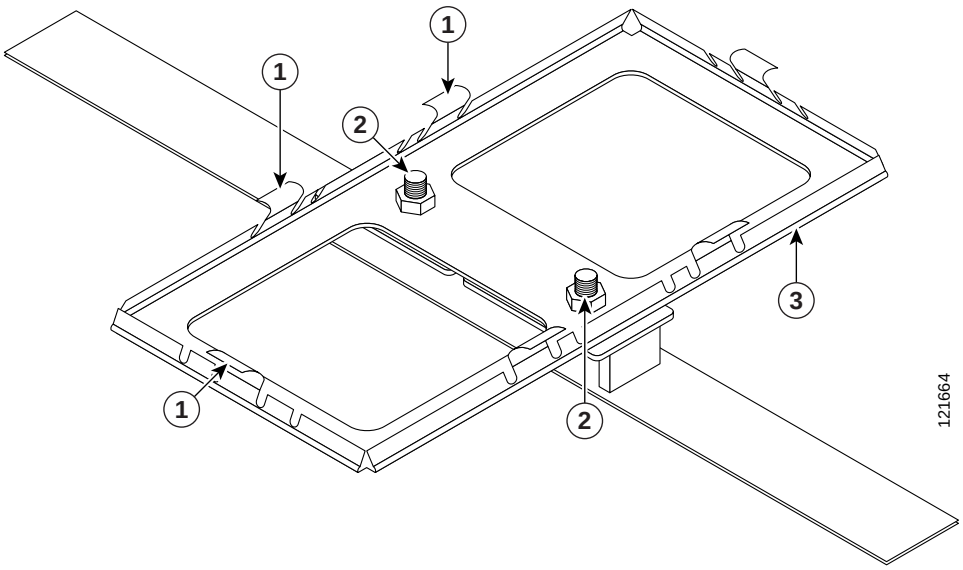
Follow these safety precautions when installing your antenna.

- Plan your installation procedure carefully and completely before you begin.
- If you are installing an antenna for the first time, for your own safety as well as others, seek **professional assistance**. Consult your dealer, who can explain which mounting method to use for the location where you intend to install the antenna.
- Select your installation site with safety, as well as performance, in mind. Remember that electric power lines and telephone lines look alike. For your safety, assume that any line is an electric power line until determined otherwise.
- Call your local power company or building maintenance organization if you are unsure about cables close to your intended mounting location.
- If an accident or emergency occurs with the power lines, call for qualified emergency help immediately.
- When installing your antenna in any location, **do not** use a metal ladder. **Do** dress properly - shoes with rubber soles and heels, rubber gloves, and a long sleeved shirt or jacket. When drilling mounting holes, wear safety glasses.

Installing the Antenna

The antenna ships with a mounting bracket and the hardware required to install the antenna on a suspended ceiling. Two mounting methods are available. You can mount the antenna using standard suspended ceiling T-rail clips or you can mount the antenna using the clips attached to the antenna mounting bracket. Figure 1 shows the layout of the detachable mounting bracket configured to use the suspended ceiling T-rail clips.

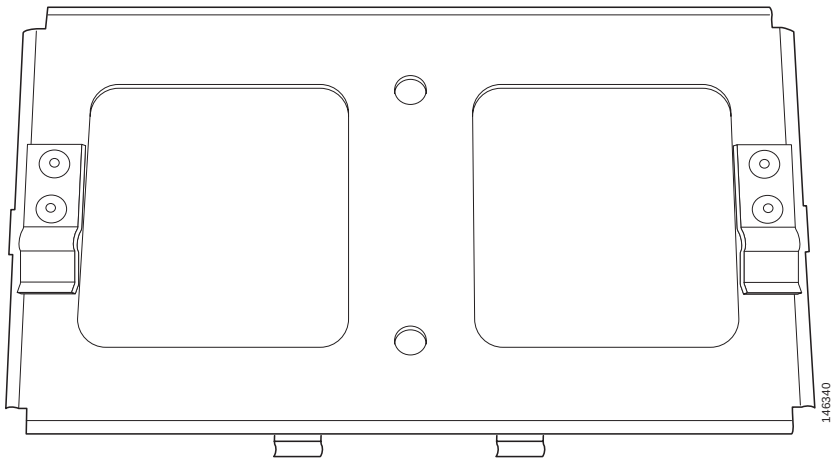
Figure 1 Mounting Bracket Configured to Use Suspended Ceiling T-rail Clips



1	Retaining tabs	**3**	Mounting bracket
2	T-rail clip fastener		

Figure 2 shows how the antenna mounting bracket is attached to a suspend ceiling T-rail using the attached clips.

Figure 2 Antenna Mounting Bracket Attached Mounting Clip Location



Tools and Equipment Required

To install the antenna, you will need the following tools and equipment.

- The mounting kit supplied with your antenna consisting of:
  - Mounting bracket
  - Two T-rail clips with studs
  - Two plastic spacers
  - Two 1/4-20 T-rail nuts with built-in washers
- A 9 mm open end wrench or suitable pliers
- Standard screwdriver
- A 3/4 in. (20 mm) drill bit
- A Drill
- A pencil or suitable marker

Installing the Antenna Using T-Rail Clips

Follow these steps to install the antenna using the T-rail clips. It may be helpful to refer to before you begin.

Step 1 Choose a location in which to install the antenna.

Step 2 Remove the adjacent ceiling panels on each side of the T-rail on which the antenna is to be installed.

Note The panels must be removed so you can attach the antenna's cables to the cables coming from the device using the antenna. Removing the pane lets you support to the ceiling T-rail when you snap the antenna in place on the mounting bracket.

Step 3 Attach the T-rail clips to the ceiling T-rail.

Step 4 Verify that the distance between the t-rail studs is 3.125-in (80 mm).

Step 5 Use a screwdriver to tighten the T-rail clip stud to the T-rail.

Step 6 Slip a plastic spacer onto the stud of each T-rail clip. Make sure the spacer legs are positioned against the T-rail. See Figure 1 for details.

Step 7 Position the mounting bracket into the T-rail clip studs.

Step 8 Start a T-rail nut on each stud.

Step 9 Tighten each T-rail nut wrench tight.

Step 10 Use the mounting bracket to determine and mark where to drill the antenna cable access hole in the ceiling panel.

Step 11 Drill a 3/4 in. (20 mm) hole at each mark.

Step 12 Position the antenna over the mounting bracket and feed each cable through its respective access hole.

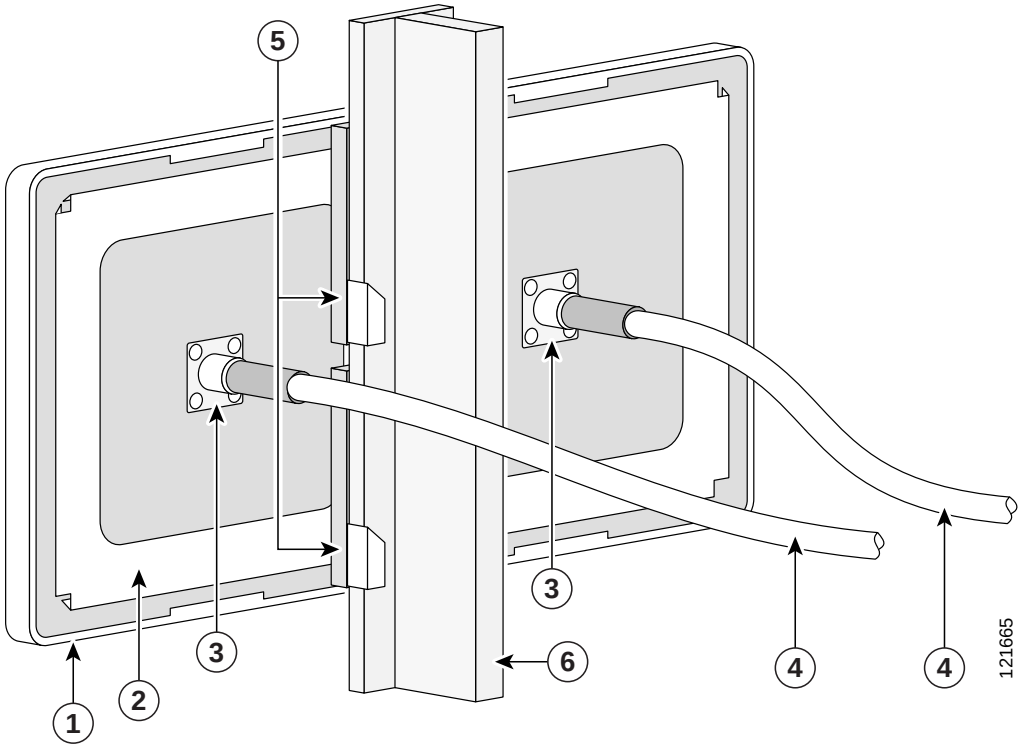
Step 13 Grasp the ceiling T-rail as closely as possible to the mounting bracket while aligning the antenna with the retaining tabs.

Step 14 Snap the antenna over the retaining tabs.

Step 15 Connect the antenna cables.

Step 16 Replace the ceiling panels.

Figure 3 T-rail Clip Installation Details



1	Antenna	**4**	Antenna cable
2	Mounting bracket	**5**	T-rail clip
3	Antenna connectors	**6**	Ceiling T-rail

Installing the Antenna Using Attached Mounting Clips

Follow these steps to install the antenna on a suspended ceiling using the mounting clips attached to the antenna mounting bracket.

Note You cannot mount the antenna on suspended ceiling having recessed tiles. The clips are designed to be used on a ceiling having flush mounted tiles.

Step 1 If the T-rail clips are fastened to the antenna mounting bracket, remove them.

Step 2 Choose a location in which to install the antenna.

Step 3 Remove the adjacent ceiling panels on each side of the T-rail on which the antenna is to be installed.

Note The panels must be removed so you can attach the antenna's cables to the cables coming from the device using the antenna. Removing the pane lets you support to the ceiling T-rail when you snap the antenna in place on the mounting bracket.

Step 4 Snap the antenna over the retaining tabs on the mounting bracket

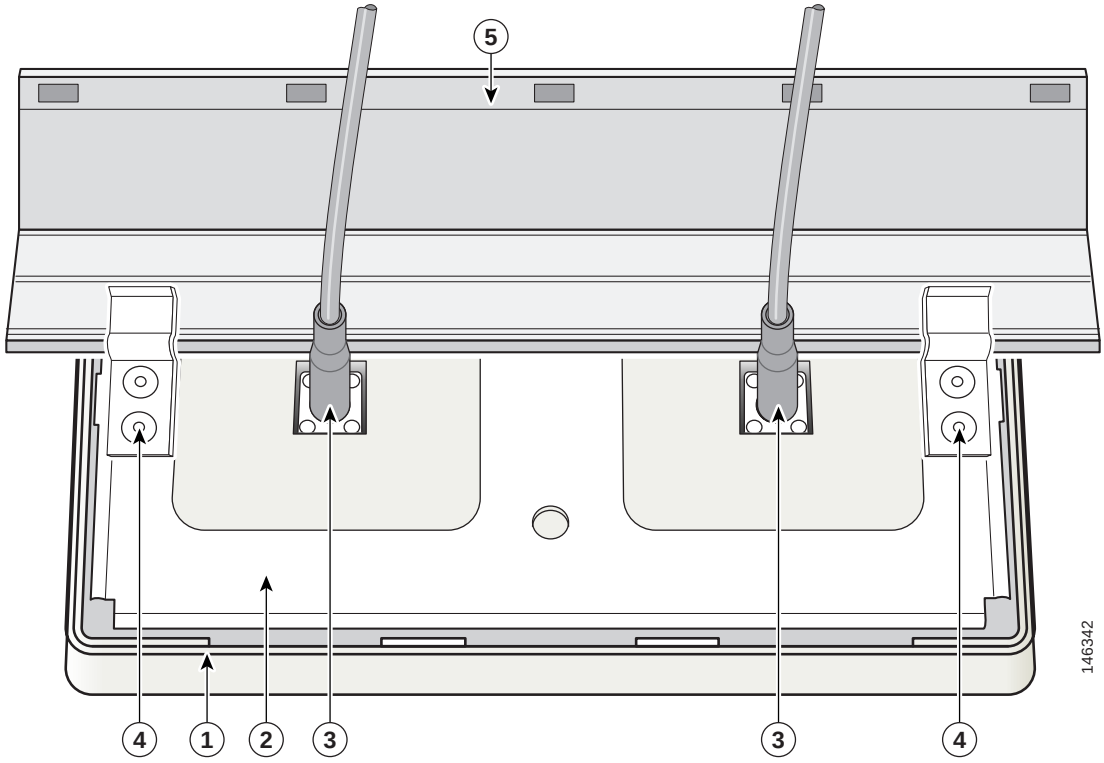
Step 5 Align the mounting clips with the edge of the ceiling T-rail where you want to mount the antenna.

Step 6 Grasp the ceiling T-rail as closely as possible to the mounting bracket while pushing the clips securely onto the rail.

Step 7 Connect the antenna cables.

Step 8 Replace the ceiling panels.

Figure 4 Attached Clip Mounting Details



1	Antenna	**4**	Mounting clips
2	Mounting bracket	**5**	Ceiling T-rail
3	Antenna connectors		

Suggested Cable

Cisco recommends a high-quality, low-loss cable for use with the antenna.

Note Coaxial cable loses efficiency as the frequency increases, resulting in signal loss. The cable should be kept as short as possible because cable length also determines the amount of signal loss (the longer the run, the greater the loss).

The antenna terminates with a RP-TNC plug after a short, 3-ft (0.91-m) cable. The mating connector to the antenna is an appropriate RP-TNC jack.

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. This section explains the product documentation resources that Cisco offers.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/techsupport

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

The Product Documentation DVD is a library of technical product documentation on a portable medium. The DVD enables you to access installation, configuration, and command guides for Cisco hardware and software products. With the DVD, you have access to the HTML documentation and some of the PDF files found on the Cisco website at this URL:

http://www.cisco.com/univercd/home/home.htm

The Product Documentation DVD is created and released regularly. DVDs are available singly or by subscription. Registered Cisco.com users can order a Product Documentation DVD (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at the Product Documentation Store at this URL:

http://www.cisco.com/go/marketplace/docstore

Ordering Documentation

You must be a registered Cisco.com user to access Cisco Marketplace. Registered users may order Cisco documentation at the Product Documentation Store at this URL:

http://www.cisco.com/go/marketplace/docstore

If you do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Documentation Feedback

You can provide feedback about Cisco technical documentation on the Cisco Technical Support & Documentation site area by entering your comments in the feedback form available in every online document.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you will find information about how to do the following:

- Report security vulnerabilities in Cisco products
- Obtain assistance with security incidents that involve Cisco products
- Register to receive security information from Cisco

A current list of security advisories, security notices, and security responses for Cisco products is available at this URL:

http://www.cisco.com/go/psirt

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you have identified a vulnerability in a Cisco product, contact PSIRT:

- For emergencies only—security-alert@cisco.com

  An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- For nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Tip We encourage you to use Pretty Good Privacy (PGP) or a compatible product (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.*x* through 9.*x*.

Never use a revoked encryption key or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

The link on this page has the current PGP key ID in use.

If you do not have or use PGP, contact PSIRT to find other means of encrypting the data before sending any sensitive material.

Product Alerts and Field Notices

Modifications to or updates about Cisco products are announced in Cisco Product Alerts and Cisco Field Notices. You can receive Cisco Product Alerts and Cisco Field Notices by using the Product Alert Tool on Cisco.com. This tool enables you to create a profile and choose those products for which you want to receive information.

To access the Product Alert Tool, you must be a registered Cisco.com user. (To register as a Cisco.com user, go to this URL: http://tools.cisco.com/RPF/register/register.do) Registered users can access the tool at this URL: http://tools.cisco.com/Support/PAT/do/ViewMyProfiles.do?local=en

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note Use the **Cisco Product Identification Tool** to locate your product serial number before submitting a request for service online or by phone. You can access this tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link, clicking the **All Tools (A-Z)** tab, and then choosing **Cisco Product Identification Tool** from the alphabetical list. This tool offers three search options: by product ID or model name; by tree view; or, for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Tip Displaying and Searching on Cisco.com

If you suspect that the browser is not refreshing a web page, force the browser to update the web page by holding down the Ctrl key while pressing F5.

To find technical information, narrow your search to look in technical documentation, not the entire Cisco.com website. On the Cisco.com home page, click the **Advanced Search** link under the Search box and then click the **Technical Support & Documentation** radio button.

To provide feedback about the Cisco.com website or a particular technical document, click **Contacts & Feedback** at the top of any Cisco.com web page.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests, or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411
Australia: 1 800 805 227
EMEA: +32 2 704 55 55
USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—An existing network is “down” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of the network is impaired while most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The Cisco Online Subscription Center is the website where you can sign up for a variety of Cisco e-mail newsletters and other communications. Create a profile and then select the subscriptions that you would like to receive. To visit the Cisco Online Subscription Center, go to this URL:

  http://www.cisco.com/offer/subscribe

- The *Cisco Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco channel product offerings. To order and find out more about the *Cisco Product Quick Reference Guide*, go to this URL:

  http://www.cisco.com/go/guide

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

  http://www.cisco.com/go/marketplace/

- Cisco Press publishes a wide range of general networking, training, and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

  http://www.ciscopress.com

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:

  http://www.cisco.com/ipj

- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:

  http://www.cisco.com/en/US/products/index.html

- Networking Professionals Connection is an interactive website where networking professionals share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

  http://www.cisco.com/discuss/networking

- “What’s New in Cisco Documentation” is an online publication that provides information about the latest documentation releases for Cisco products. Updated monthly, this online publication is organized by product category to direct you quickly to the documentation for your products. You can view the latest release of “What’s New in Cisco Documentation” at this URL:

  http://www.cisco.com/univercd/cc/td/doc/abtunicd/136957.htm

- World-class networking training is available from Cisco. You can view current offerings at this URL:

  http://www.cisco.com/en/US/learning/index.html

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